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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER

NOTE, JANIS L

ART UNIT PAPER NUMBER

1756

DATE MAILED: 05/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/615,770

Applicant(s)

MOCHIZUKI ET AL.

Examiner

Janis L. Dote

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 January 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9, 11-15, 17-20 and 22-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9, 11-15, 17-20 and 22-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 January 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449, or PTO/SB/08)
Paper No(s)/Mail Date 12/4/03; 10/12/04; 11/1/04; 12/28/04
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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1. The examiner acknowledges the cancellation of claims 10, 16, and 21, the amendments to claims 1, 3, 6, 11, 12-14, and 17-19, and the addition of claims 22-29, set forth in the amendment filed on Jan. 10, 2005. Claims 1-9, 11-15, 17-20, and 22-29 are pending.

2. The examiner has deleted the US patents listed on the "List of related cases" filed in the Information Disclosure statement (IDS) filed on Dec. 4, 2003, because they have already been considered by the examiner and are listed on the form PTO-1449 filed on Dec. 4, 2003.

The examiner has also deleted the US applications 10/032,172 and 09/864,596 listed on the "List of related cases" filed in the IDS filed on Dec. 4, 2003, because applicants did not provide copies of the portions of the US applications which caused them to be listed as requested in the office action mailed Sep. 9, 2004, paragraph 2. The copies of the portions of the US applications filed by applicants on Oct. 12, 2004, and Nov. 1, 2004, did not include copies of the US applications 10/032,172 and 09/864,596.

The examiner has considered only the material submitted by applicants, i.e., copies of the originally filed claims,

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abstracts, and figures of the remaining US applications listed on the "List of related cases" in the IDS filed on Dec. 4, 2003.

The examiner has considered the US application listed on the "List of related cases" in the Information Disclosure statement filed on Dec. 28, 2004.

3. The information disclosure statements filed on Sep. 15, 2004, and Sep. 24, 2004, do not fully comply with the requirements of 37 CFR 1.98(b) because: they fail to comply with 37 CFR 1.98(a)(2)(iii), which requires legible copies of those portions of the copending U.S. patent applications which caused them to be listed.

Contrary to applicants' statements, the waiver of the copy requirement in 37 CFR 1.98 for cited pending U.S. patent applications was published in the Official Gazette on Oct. 19, 2004, after the disclosure statements were filed on Sep. 15, 2004, and Sep. 24, 2004. See 1287 Off. Gaz. Pat. Office 163 (Oct. 19, 2004). The waiver was not retroactive.

Since the submission appears to be *bona fide*, applicant is given **ONE (1) MONTH** from the date of this notice to supply the above mentioned omissions or corrections in the information disclosure statement. **NO EXTENSION OF THIS TIME LIMIT MAY BE GRANTED UNDER EITHER 37 CFR 1.136(a) OR (b).** Failure to timely

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comply with this notice will result in the above mentioned information disclosure statement being placed in the application file with the noncomplying information **not** being considered.

See 37 CFR 1.97(i).

4. The replacement drawing sheets of Figs. 6-8 filed on Jan. 10, 2005, are acceptable.

5. The objections to the drawings set forth in the office action mailed on Sep. 9, 2004, paragraphs 3 and 4, have been withdrawn in response to the replacement drawing sheets of Figs. 6-8 filed on Jan. 10, 2005, and the amended paragraph filed on Jan. 10, 2005, beginning at page 92, line 16, of the specification.

The objection to the specification set forth in the office action mailed on Sep. 9, 2004, paragraph 5, item (2), has been withdrawn in response to the amended paragraph filed on Jan. 10, 2005, beginning at page 71, line 19, of the specification.

The rejections of claims 3, 8, and 12-21 under 35 U.S.C. 112, second paragraph, set forth in the office action mailed on Sep. 9, 2004, paragraph 8, have been withdrawn in response to the amendments to claims 3, 8, 12, 14, 17, and 18, and the

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cancellation of claims 10, 16, and 21 set forth in the amendment filed on Jan. 10, 2005.

The rejection of claims 1, 5, 6, 10, 17, and 21 under 35 U.S.C. 102(b) over European Patent 892,319 A1 (EP'319), set forth in the office action mailed on Sep. 9, 2004, paragraph 14, has been withdrawn in response to the amendments filed on Jan. 10, 2005, to claims 1, 6, and 17, adding the limitation that the inorganic fine particles have "an average degree of roundness greater than or equal to 0.98 and less than or equal to 0.996." EP'319 does not teach or suggest that its inorganic fine particles have an average degree of roundness as recited in the instant claims. Nor is there enough information on the present record for a person having ordinary skill in the art to reasonably presume that the EP'319 inorganic particles have the average degree of roundness as recited in the instant claims.

The rejection of claims 12-16 under 35 U.S.C. 102(e) over US 2003/0118366 A1 (Nukada), set forth in the office action mailed on Sep. 9, 2004, paragraph 16, has been withdrawn in response to the amendment filed on Jan. 10, 2005, to claim 12, adding the limitation that the process cartridge comprises the particular toner recited in claim 16. Nukada does not disclose the use of the particular developer recited in instant claim 16.

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6. The disclosure is objected to because of the following informalities:

The use of trademarks, e.g. Henschel mixer [sic: HENSCHEL MIXER] in the amended paragraph filed on Jan. 10, 2005, beginning at page 106, line 9, of the specification, has been noted in this application. The trademarks should be capitalized wherever they appear and be accompanied by the generic terminology. This example is not exhaustive. Applicants should review the entire specification for compliance.

Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks.

Appropriate correction is required.

Applicant's arguments filed on Jan. 10, 2005, have been fully considered but they are not persuasive.

Applicants assert that the amendment to the specification filed on Jan. 10, 2005, overcomes the objection. However, for the reasons discussed in the objection above, the amendment file on Jan. 10, 2005, did not capitalize all the trademarks disclosed in the instant specification.

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7. The examiner notes that the instant specification at page 69, lines 9-23, discloses that the parameters SF-1 and SF-2 recited in the instant claims are determined from the following equations 1 and 2:

Equation 1. $SF-1 = ((\text{absolute maximum length of a toner particle})^2 / \text{projection area of a toner particle}) \times (\pi/4) \times 100$

Equation 2. $SF-2 = (\text{peripheral length of toner particle})^2 / (\text{projection area of a toner particle}) \times (\pi/4) \times 100$

In other words, the "area of the particle of the base toner" in the formulas recited in the instant claims is a "projection area" of the toner base.

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 1-9, 11-15, 17-20, 23, 24, 27, and 28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

(1) Claims 1-9, 11-15, and 17-20 are indefinite in the phrase "average degree of roundness greater than or equal to

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0.98 and less than or equal to 0.996" because it is not clear what is meant by the term "average degree of roundness."

Moreover, neither the instant specification nor the claims define the term "average degree of roundness." See the instant specification at page 36, line 11, to page 37, line 11, which discloses that the "degree of roundness can be measured with various methods. For example, the degree of roundness may be obtained by using an image processing software for statistically analyzing photographs obtained from a scanning electron microscopy, and then, by obtaining an arithmetic mean of degree of roundness according to the following formula [disclosed at page 37, lines 1-11]" (emphasis added).

(2) Claims 6-9, 11, 23, and 27 are indefinite in the phrase "apparatus, comprising a developer." Claims 12-15, 24, and 29 are indefinite in the phrase "process cartridge, comprising a developer." It is not clear what is the structural relationship between the apparatus and the developer or the structural relationship between the process cartridge and the developer. It is not clear how an apparatus or a process cartridge comprises a developer. A developer is not a structural element of an apparatus or a process cartridge, such as a charging device, but is merely a material or an article that is worked upon by the apparatus or process cartridge. The claims do not

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recite any structural relationship between the apparatus and the developer or between the process cartridge and the developer.

Applicants' arguments filed on Jan. 10, 2005, regarding the rejection in item (2) above, have been fully considered but they are not persuasive.

Applicants assert that the developer is part of the apparatus and that the specification provides an adequate description of the operation of the developer in the image forming apparatus.

Although instant 6 and 27 positively recite the presence of a developer, the instant claims do not recite how the developer is related to the other structural component, the transfer unit recited in the instant claims. An apparatus is defined by its structural elements. As discussed in the rejection above, the developer is not a structural element of an apparatus or a process cartridge, such as a charging device, but is merely a material or an article that is worked upon by the apparatus or process cartridge. Accordingly, the rejection stands.

(To overcome the rejection, the examiner suggests that claims 6 and 27 be amended such that the claims recite the limitation "a developing unit for developing an electrostatic latent image formed on an electrostatic latent image carrier body with a developer to form a toner image, wherein the

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developing unit comprises said developer"; and that claims 12 and 28 be amended such that the claims recite the limitation "a developing unit developing the image formed on the photoconductor to form an image on the photoconductor with a developer, wherein the developing unit comprises said developer" (emphasis added).)

10. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

11. Claims 11, 13, 18, and 22-29 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

(1) Instant claim 11 recites that "the coloring agent includes a plurality of colors."

The originally filed specification does not provide an adequate written description of said coloring agent. The originally filed specification at page 23, lines 12-13, discloses that "the developer comprises a plurality of colors." The originally filed specification at page 51, lines 10-12, discloses that the "various conventional dyes and pigments may be used as the colorant of the toner," but does not disclose that the colorant is a plurality of colors as recited in instant claim 11. Applicants have not indicated where in the originally filed specification there is antecedent basis for the limitation "coloring agent includes a plurality of colors" recited in instant claim 11.

(2) Instant claims 13 and 18 recite that the inorganic fine particles recited in instant claims 12 and 17, respectively, "include a silica."

The originally filed specification does not provide an adequate written description of said inorganic fine particles. The originally filed specification discloses that the "inorganic fine particles are formed as silica." See the originally filed specification, page 21, lines 14-15, page 22, lines 21-22, page 24, lines 10-11, and page 25, lines 20-21. The phrase "includes a silica" is broader than the originally disclosed inorganic fine particles "formed as silica" because it

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encompasses inorganic fine particles that comprise both silica and another inorganic composition, such as titanium oxide.

Applicants have not indicated where in the originally filed specification there is antecedent basis for the limitation "inorganic fine particles include a silica" as recited instant claims 13 and 18.

(3) Instant claims 22-25 recite that the "degree of roundness is calculated as a peripheral length of a circle having an area equal to an area of an image of an inorganic fine particle divided by a peripheral length of the image of the inorganic fine particle."

The originally filed specification does not provide an adequate written description of said degree of roundness. The originally filed specification at page 37, lines 1-11, defines a degree of roundness as an "outer peripheral length of a circle having an area equal to an area of . . . [a] binarized particle image" of an inorganic particle divided by a "length of an outlined portion obtained by connecting edge points of . . . [the] binarized particle image" of the inorganic particle. The originally filed specification at page 36, lines 12-17, discloses that the degree of roundness "may be obtained by using an image processing software for statistically analyzing photographs obtained from a scanning electron microscopy, and

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then, by obtaining an arithmetic mean of degree of roundness according to the following formula {the formula disclosed at page 37, lines 1-11}." The term "image" is broader than the originally disclosed "binarized image" because it encompasses images that are not "binarized." Applicants have not indicated where in the originally filed specification there is antecedent basis for the definition of the term "degree of roundness" recited in instant claims 22-25.

(4) Instant claims 26-29 recite that the base toner SF-1 value and SF-2 value satisfy the inequality $SF-1 < SF-2$.

The originally filed specification does not provide an adequate written description of said inequality. The originally filed specification discloses that the base toner have a SF-1 value and a SF-2 value that satisfies the relations " $105 \leq SF-1 \leq 130$ and $120 \leq SF2 \leq 180$." See the originally filed specification, page 21, lines 5-6, page 22, line 12, page 24, line 2, and page 25, line 11. The originally filed specification does not disclose the inequality recited in instant claims 26-29. Applicants have not indicated where in the originally filed specification there is antecedent basis for the inequality $SF-1 < SF-2$ recited in instant claims 26-29.

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12. Claims 17 and 29 are objected to because of the following informalities:

There is an extraneous parenthesis ")" after the number 100 in the SF-1 formula.

Appropriate correction is required.

13. In the interest of compact prosecution, the examiner has interpreted that the average degree of roundness recited in instant claims 1, 6, 12, and 17 as the arithmetic mean of the degree of roundness of the inorganic fine particles, where the degree of roundness is defined as a peripheral length of a circle having an area equal to an area of a binarized particle image of an inorganic particle divided by the length of an outlined portion obtained by connecting the edge points of the binarized particle image of the inorganic particle. Antecedent basis for the examiner's definition can be found at page 36, lines 16-17, and page 37, lines 1-11, of the instant specification.

14. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

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15. Claims 26, 27, and 29 are rejected under 35 U.S.C. 102(b) as being anticipated by US 5,827,632 (Inaba).

Inaba discloses a developer comprising a magnetic carrier and a toner. The toner comprises toner particles comprising a binder resin and a colorant, hydrophobic inorganic fine powder a-1, and hydrophobic silicon compound fine powder (A). The toner particles have a shape factor SF-1 of 109 and a shape factor SF-2 of 120. The shape factors SF-1 and SF-2 are determined in the same manner as recited in the instant claims. Col. 7, line 57, to col. 8, line 6. The hydrophobic silicon compound fine powder (A) comprises silica particles and has an average particle diameter of 40 nm. Col. 27, lines 5-8; Table 1, hydrophobic silicon compound fine powder (A); and example 7 at cols. 31-32. The shape factors SF-1 and SF-2 are within the respective ranges recited in instant claims 26, 27, and 29. The Inaba shape factors SF-1 and SF-2 also satisfy the inequality $SF-1 < SF-2$ recited in instant claims 26, 27, and 29. The hydrophobic silicon compound fine powder (A) meets the limitations regarding the inorganic fine particles recited in instant claims 26, 27, and 29.

Inaba further discloses an image forming apparatus comprising a developing unit 74 comprising the developer described above and a transfer unit 77. Fig. 7; col. 21,

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line 45, to col. 24, line 29. The apparatus meets the components recited in instant claim 27. Inaba also discloses an image forming method comprising the steps recited in instant claims 29, where the developer described above is used to develop the latent image formed on the photoconductor. Fig. 7, col. 21, line 45, to col. 24, line 29; and Table 5 at col. 35, example 7.

16. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 2003/0118366 (Nukada) combined with Inaba.

Nukada discloses a process cartridge comprising a particular photoreceptor. Nukada discloses that the cartridge may further contain units appropriately selected from the charging unit, the exposing unit, the developing unit, the transferring unit, and the cleaning unit previously described in Nukada. Paragraph 0115, lines 1-7. Nukada further discloses that the developing unit may be a unit in which development is conducted with a two-component developer that comprises a toner and carrier. Paragraph 0110, lines 1-12. Thus, Nukada teaches a process cartridge that comprises a charging unit, an exposing unit, a developing unit, a transfer unit, and a cleaning unit.

Nukada does not disclose the use of a developer as recited in the instant claim. However, as discussed supra, Nukada

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discloses that the developing unit may comprise a developer comprising a toner and a carrier.

Inaba discloses a developer comprising a toner and a carrier as described in paragraph 15, supra. The developer meets the developer limitations recited in instant claim 28. The discussion of Inaba in paragraph 15 above is incorporated herein by reference. According to Inaba, the developer has excellent performance in continuous image formation on a large number of sheets. Col. 2, lines 21-24, and Table 5, example 7.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of Inaba, to use the developer in example 7 of Inaba as the developer in the process cartridge disclosed by Nukada, because that person would have had a reasonable expectation of successfully obtaining a process cartridge that provides continuous image formation on a large number of sheets.

17. Claims 1, 2, 5-7, 11, 17, 18, 22, 23, and 25 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Inaba, as evidenced by applicants' admission in the instant specification at page 37, lines 11-22, and the tables at page 115, embodiment 7, and the accompanying text (applicants' admission I).

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Inaba discloses a developer, an image forming apparatus, and an image forming method, as described in paragraph 15 above, which is incorporated herein by reference.

As discussed in paragraph 15 above, the toner in example 7 has values of SF-1 and SF-2 that are within the SF-1 and SF-2 values recited in the instant claims. The hydrophobic silicon compound fine powder (A) has an average particle diameter that meets the particle size limitations recited in instant claims 1, 6 and 17. Inaba further teaches that the colorant can be a black colorant that comprises a mixture of yellow, magenta, and cyan colorants. Col. 5, lines 15-16. Thus, the Inaba black colorant meets the limitation "coloring agent includes plurality of colors" recited in instant claim 11.

Inaba does not disclose that the hydrophobic silicon compound fine powder (A) has an average degree of roundness as recited in instant claims 1, 6, 17, 22, 23, and 25. However, the instant specification at page 37, lines 11-23, discloses that "[i]n a case where the average degree of roundness of the silica particle is below 0.95, fluidity of the toner, supply property of the toner, and preservation property of toner shall decrease. In a case where the average degree of roundness of the silica particle is above 0.996, retaining silica particles on the toner surface shall become difficult, affinity between

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the silica particles and the toner shall decrease, the silica particles shall be unable to function as external additives, storing property and chargeability with respect to environment shall deteriorate, to thereby affecting the image." The instant specification shows that when a developer comprises inorganic fine particles having an average degree of roundness of 0.990, the developer exhibits good cleaning properties and toner transfer rate, and provides images without blanks. See the tables at page 115, embodiment 7, and the accompanying text. The developer in example 7 of Inaba exhibits stable charging properties under several different environmental conditions. The Inaba developer exhibits good anti-blocking properties (i.e., storing or preservation property), and high transfer efficiency. The developer also exhibits good cleaning properties and provides images without white dropout. See Table 5 at col. 35, example 7, and the accompanying text. These are the properties sought by applicants. Thus, because the Inaba developer in example 7 appears to exhibit the properties sought by applicants, it is reasonable to presume that the Inaba inorganic fine powder (A) has an average roundness as recited in instant claims 1, 6, 17, 22, 23, and 25. The burden is on applicants to prove otherwise. In re Fitzgerald, 205 USPQ 594 (CCPA 1980).

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18. Claims 12, 13, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nukada combined with Inaba.

Nukada discloses a process cartridge as described in paragraph 16 above, which is incorporated herein by reference. Nukada does not disclose the use of a developer as recited in the instant claims.

Nukada does not disclose the use of a developer as recited in the instant claims. However, as discussed in paragraph 16 above, Nukada discloses that the developing unit may comprise a developer comprising a toner and a carrier.

Inaba discloses a developer comprising a toner and a carrier as described in paragraph 17, supra. The developer meets the developer limitations recited in instant claims 12, 13, and 24. The discussion of Inaba in paragraph 17 above is incorporated herein by reference. According to Inaba, the developer has excellent performance in continuous image formation on a large number of sheets. Col. 2, lines 21-24, and Table 5, example 7.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of Inaba, to use the developer in example 7 of Inaba as the developer in the process cartridge disclosed by Nukada, because that person would have

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had a reasonable expectation of successfully obtaining a process cartridge that provides continuous image formation on a large number of sheets.

19. Claims 1, 4-6, 9, 11, 17, 20, 22, 23, and 25 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Inaba, as evidenced by applicants' admission I.

Inaba discloses a developer, an image forming apparatus, and method of forming an image, as described in paragraph 15 above, which is incorporated herein by reference.

As discussed in paragraph 15, the developer disclosed by Inaba comprises toner particles, hydrophobic inorganic fine powder a-1, and hydrophobic silicon compound fine powder (A). The hydrophobic silicon compound fine powder (A) comprises silica particles and has an average particle diameter of 40 nm. The hydrophobic inorganic fine powder a-1 has an average particle diameter of 51 nm. Table 1 at col. 30, fine powder a-1. The fine powder a-1 meets the inorganic fine powder particle size limitation recited in instant claims 1, 6, and 17. The hydrophobic silicon compound fine powder (A) meets the "further inorganic fine particles" limitation recited in instant claims 4, 9, and 20. Inaba further teaches that the colorant

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can be a black colorant that comprises a mixture of yellow, magenta, and cyan colorants. Col. 5, lines 15-16. Thus, the Inaba black colorant meets the limitation "coloring agent includes plurality of colors" recited in instant claim 11.

Inaba does not disclose that the hydrophobic inorganic fine powder a-1 has an average degree of roundness as recited in instant claims 1, 6, 17, 22, 23, and 25. However, the instant specification at page 37, lines 11-23, discloses that if the degree of roundness is below 0.95, "fluidity of the toner, supply property of the toner, and preservation property of toner shall decrease"; and that if the average degree of roundness is above 0.996, "retaining silica particles on the toner surface shall become difficult, affinity between the silica particles and the toner shall decrease, the silica particles shall be unable to function as external additives, storing property and chargeability with respect to environment shall deteriorate, to thereby affecting the image." The discussion of the instant specification in paragraph 17 above is incorporated herein by reference. The developer in example 7 of Inaba exhibits stable charging properties under several different environmental conditions. The Inaba developer exhibits good anti-blocking properties (i.e., storing or preservation property), and high transfer efficiency. The developer also exhibits good cleaning

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properties and provides images without white dropout. See Table 5 at col. 35, example 7, and the accompanying text. These are the properties sought by applicants. Thus, because the Inaba developer in example 7 appears to exhibit the properties sought by applicants, it is reasonable to presume that the inorganic fine powder a-1 has an average roundness as recited in instant claims 1, 6, 17, 22, 23, and 25. The burden is on applicants to prove otherwise. Fitzgerald, supra.

20. Claims 12, 15, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nukada combined with Inaba.

Nukada discloses a process cartridge as described in paragraph 16 above, which is incorporated herein by reference. Nukada does not disclose the use of a developer as recited in the instant claims.

Nukada does not disclose the use of a developer as recited in the instant claims. However, as discussed in paragraph 16 above, Nukada discloses that the developing unit may comprise a developer comprising a toner and a carrier.

Inaba discloses a developer comprising a toner and a carrier as described in paragraph 19, supra. The developer meets the developer limitations recited in instant claims 12, 15, and 24. The discussion of Inaba in paragraph 19 above is

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incorporated herein by reference. According to Inaba, the developer has excellent performance in continuous image formation on a large number of sheets. Col. 2, lines 21-24, and Table 5, example 7.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of Inaba, to use the developer in example 7 of Inaba as the developer in the process cartridge disclosed by Nukada, because that person would have had a reasonable expectation of successfully obtaining a process cartridge that provides continuous image formation on a large number of sheets.

21. Applicant's arguments filed on Jan. 10, 2005, with respect to the rejections over Inaba in paragraphs 17-20 above have been fully considered but they are not persuasive.

Applicants assert that Inaba does not disclose that its inorganic fine particles have the average degree of roundness as recited in the instant claims.

However, for the reasons discussed in the rejections in paragraphs 17 and 19, it is reasonable to presume that the Inaba inorganic particles have the average degree of roundness as recited in the instant claims. The preponderance of the evidence on the present record favors the rejections.

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Accordingly, the rejections over Inaba in paragraphs 17-20 stand.

22. Claims 1-9, 17-20, 22, 23, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,177,223 B1 (Hashimoto) combined with US 6,403,271 B1 (Suzuki), as evidenced by applicants' admission I.

Hashimoto discloses developers comprising a magnetic carrier and a color toner. The color toner comprises color toner particles, which comprise a binder resin, a release agent, and a colorant, and hydrophobic silica powder. Col. 29, lines 27-34 and 55-63; and Table 1 at col. 34, toners A2, A3, and A4. The magenta-colored toner particles of toner A2 have a shape factor SF-1 of 127 and a shape factor SF-2 of 123. The cyan-colored toner particles of toner A3 have a shape factor SF-1 of 123 and a shape factor SF-2 of 121. The yellow-colored toner particles of toner A4 have a shape factor SF-1 of 130 and a shape factor SF-2 of 120. The shape factors SF-1 and SF-2 are determined in the same manner as recited in the instant claims. Col. 14, lines 12-28. The shape factors SF-1 and SF-2 are within the respective ranges recited in instant claims 1, 6, and 17.

Hashimoto further discloses an image forming apparatus comprising a developing unit 4 comprising the developers described above and a transfer unit 7. Fig. 1; col. 21, line 18, to col. 22, line 44; and col. 34, lines 46-50. The developers in the developing unit 4 comprise the toners A2, A3, and A4. Hashimoto also discloses an image forming method comprising the steps recited in instant claim 17, but for the use of a developer comprising the particular inorganic fine particles recited in instant claim 17. The developers described above are used to develop the latent image formed on the photoconductor. Fig. 1, and col. 34, line 46, to col. 35, line 32.

Hashimoto does not exemplify the use of the inorganic fine particles as recited in instant claims 1, 6, and 17. However, as discussed above, Hashimoto's developers comprise an externally added hydrophobic silica powder.

Suzuki teaches developers comprising toner particles combined with (1) monodisperse hydrophobic spherical silica particles B obtained by a sol-gel method having an average particle size of 80 nm; and (2) inorganic particles obtained by subjecting metatitanic acid ($\text{TiO}(\text{OH})_2$) to an isobutyltrimethoxysilane treatment, which have an average particle size of 35 nm. See monodisperse spherical silica B at

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col. 17, lines 35-40, and example 2 at col. 22. The hydrophobic spherical silica particles B taught by Suzuki meet the particle size and compositional limitations regarding the inorganic fine particles recited in instant claims 1-3, 6-9, and 17-19. The inorganic particles obtained by subjecting metatitanic acid ($\text{TiO}(\text{OH})_2$) to an isobutyltrimethoxysilane treatment meet the "further inorganic fine particles" limitation recited in instant claims 4, 9, and 20. According to Suzuki, the use of the hydrophobic spherical silica particles B provides a developer in which "the toner flowability, charging property, the developing property, the transferring property, and the fixing property are simultaneously satisfied in a long period of time." Col. 4, line 48, to col. 5, line 5. Suzuki further discloses that the use of the inorganic particles comprising metatitanic acid ($\text{TiO}(\text{OH})_2$) can provide developers that are excellent in charging property, environment stability, flowability, caking resistance, stable negative charging property, and "stable image quality maintenance property." Col. 10, lines 39-43.

Suzuki does not disclose that the monodisperse hydrophobic spherical silica particles B have an average degree of roundness as recited in instant claims 1, 6, 17, 22, 23, and 25. However, the instant specification at page 37, lines 11-23, discloses that if the degree of roundness is below 0.95, "fluidity of the

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toner, supply property of the toner, and preservation property of toner shall decrease"; and that if the average degree of roundness is above 0.996, "retaining silica particles on the toner surface shall become difficult, affinity between the silica particles and the toner shall decrease, the silica particles shall be unable to function as external additives, storing property and chargeability with respect to environment shall deteriorate, to thereby affecting the image." The discussion of the instant specification in paragraph 17 above is incorporated herein by reference. As discussed supra, the Suzuki hydrophobic spherical silica particles B are obtained by a process within the process limitations recited in claims 3, 8, and 14. Suzuki teaches that the use of the hydrophobic spherical silica particles B provides a developer in which "the toner flowability, charging property, the developing property, the transferring property, and the fixing property are simultaneously satisfied in a long period of time." Col. 4, line 48, to col. 5, line 5. Suzuki teaches that because the hydrophobic spherical silica particles are monodisperse and spherical, the particles are uniformly dispersed on the surface of the toner particles. Col. 7, lines 46-49. Suzuki shows that when the developer comprises the hydrophobic spherical silica particles B, the developer exhibits good charging properties

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under different environmental conditions. The developer also exhibits good transfer efficiency. See Table 5 at col. 35, example 2, and the accompanying text. The properties sought by Suzuki are the same properties sought by applicants. Thus, because the Suzuki hydrophobic spherical silica particles B are obtained by a process within the process limitations recited in instant claims 3, 8, and 19, and because developers comprising the Suzuki hydrophobic spherical silica particles B appear to exhibit the properties sought by applicants, it is reasonable to presume that the Suzuki hydrophobic spherical silica particles B have an average roundness as recited in instant claims 1, 6, 17, 22, 23, and 25. The burden is on applicants to prove otherwise: Fitzgerald, supra.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of Suzuki, to use the hydrophobic spherical silica particles B and metatitanic acid inorganic particles taught by Suzuki as the external additive in the developers disclosed by Hashimoto, because that person would have had a reasonable expectation of successfully obtaining color developers having satisfactory toner flowability, charging property, the developing property, the transferring property, and the fixing property for a long period of time. It also would have been obvious for that person to use the resultant

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developers in the image forming apparatus and image forming method disclosed by Hashimoto, because that person would have had a reasonable expectation of successfully obtaining an image forming apparatus and image forming method that provides satisfactory toner images for a long period of time.

23. Claims 12-15 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nukada combined with Hashimoto and Suzuki.

Nukada discloses a process cartridge as described in paragraph 16 above, which is incorporated herein by reference.

Nukada does not disclose the use of a developer as recited in the instant claims. However, as discussed in paragraph 16 above, Nukada discloses that the developing unit may comprise a developer comprising a toner and a carrier.

The combined teachings of Hashimoto and Suzuki render obvious a developer as described in paragraph 22 above, which is incorporated herein by reference. The developer meets the developer limitations recited in instant claims 12-15 and 24. In addition, according to Hashimoto, its color developers have good low-temperature fixability and storage stability, and also good continuous image forming characteristics. Col. 5, line 66, to col. 6, line 1; and Table 1, toner particles A2 through A4.

It would have been obvious for a person having ordinary skill in the art to use the developer rendered obvious over the combined teachings of Hashimoto and Suzuki as the developer in the process cartridge disclosed by Nukada, because that person would have had a reasonable expectation of successfully obtaining a process cartridge that provides satisfactory continuous toner images for a long period of time.

24. Applicants' arguments filed on Jan. 10, 2005, regarding the rejections over Hashimoto and Suzuki in paragraphs 22 and 23 above have been fully considered but they are not persuasive.

Applicants assert that Suzuki does not disclose that its spherical silica particles have the average degree of roundness as recited in the instant claims. Applicants assert that the Suzuki spherical silica particles have a degree of roundness of 0.95 or less.

However, applicants' comments regarding the Suzuki spherical degree value of 0.95 or less are not persuasive because the Suzuki spherical degree does not have the same definition as the average degree of roundness recited in the instant claims. See the discussion in paragraph 13, above. Suzuki discloses that the spherical degree is measured by a "Wadell's true spherical degree," which is defined as the

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"surface area of sphere having the same volume as actual particle (1)" divided by the "surface area of actual particle (2)," where "(1) is obtained by calculation based on the average particle diameter and (2) is substituted by a BET specific surface area measured by a measuring apparatus of powder specific surface area SS-100 produced by Shimazu Corp."

Col. 16, lines 27-38. Accordingly, applicants cannot directly compare the Suzuki spherical degree with the average degree of roundness recited in the instant claims. Furthermore, for the reasons discussed in the rejection in paragraph 22, it is reasonable to presume that the Suzuki spherical silica particles have the average degree of roundness recited in the instant claims. The preponderance of the evidence on the present record favors the rejections.

Applicants further assert that inorganic particles having an average degree of roundness in the range of 0.98 to 0.996 as recited in the instant claims provide unexpected advantages over inorganic particle that do not have an average degree of roundness.

However, the instant specification does not show that inorganic fine particles having an average degree of roundness as recited in the instant claims provide unexpected advantages. See the tables at page 115, embodiments 6 and 7. Embodiment 6

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comprises Toner 5 and silica fine particle 3, which have an average particle size of 160 nm and an average degree of roundness of 0.97, which is outside the range of 0.98 to 0.996 recited in the instant claims. Embodiment 7 comprises Toner 5 and silica fine particle 4, which have an average particle size of 120 nm and an average degree of roundness of 0.990, which is within the range of 0.98 to 0.996 recited in the instant claims. However, Embodiment 6 provides the same or substantially the same results as Embodiment 7. See the tables at page 115. Thus, the average degree of roundness cannot be said, on the present record, to be a critical parameter that establishes patentability of the claimed subject matter.

Accordingly, for the reasons discussed above and in the rejections in paragraphs 22 and 23 above, the rejections over the combined teachings of Hashimoto and Suzuki stand.

25. Applicants' amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicants are reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS**

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of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

26. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Janis L. Dote whose telephone number is (571) 272-1382. The examiner can normally be reached Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Mark Huff, can be reached on (571) 272-1385. The central fax phone number is (703) 872-9306.

Any inquiry regarding papers not received regarding this communication or earlier communications should be directed to Supervisory Application Examiner Ms. Claudia Sullivan, whose telephone number is (571) 272-1052.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JLD
May 10, 2005

Janis L. Dote
JANIS L. DOTE
PRIMARY EXAMINER
GROUP 1500
1700